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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/768,944

01/30/2004

Muhammad Asif Khan

SETI-0001DIV

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10/23/2006

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EXAMINER

ERDEM, FAZLI

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/768,944

Applicant(s)

KHAN ET AL.

Examiner

Fazli Erdem

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20, 21, 24, 25 and 28-32 is/are rejected.
- 7) ☒ Claim(s) 22, 23, 26 and 27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 8/3/2006 have been fully considered but they are not persuasive. Examiner agrees with applicant in Sugawara prior art that there are three layers between quaternary layer 105 and GaN buffer layer 102. However current application's claim 20 language does not specifically say that quaternary layer is directly on buffer layer. Therefore, even though, quaternary layer 105 is not directly on buffer layer 102 and there are three layers between them, it is technically on buffer layer.

Allowable Subject Matter

1. Claims 22, 23, 26 and 27 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

2. The following is a statement of reasons for the indication of allowable subject matter: Prior art failed to establish semiconductor device with the required molar percentage of Al and In.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 20, 21, 31 and 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Edmond et al. (5,523,589) in view of Sugawara et al. (6,359,292)

Regarding Claims 20, 21, 31 and 32, Edmond et al. disclose a vertical geometry light emitting diode with group III nitrid active layer and extended lifetime where in Fig. 1, it is disclosed a SiC (silicon carbide) substrate 21, a buffer which is nitride based and can include In (Indium) 23 on substrate, and another nitride based layer 27 which can include a quaternary layer. Edmond et al. fail to disclose the required substrate and the required quaternary layer. However, Sugawara et al. disclose a semiconductor light emitting element where in Fig. 1 and in paragraphs 5-8, active layer 105 is disclosed to be quaternary AlInGaN and is located over buffer layer 102.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required substrate and the required quaternary layer in Edmond et al. as taught by Sugawara et al. in order to have a semiconductor device with increased performance.

5. Claims 24, 25, 28, 29 and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Edmond et al. (5,523,589) in view of Sugawara et al. (6,359,292) further in view of Sasanuma et al. (JP411243251)

Regarding Claims 24, 25, 28, 29 and 30, Edmond et al. disclose a vertical geometry light emitting diode with group III nitride active layer and extended lifetime where in Fig. 1, it is disclosed a SiC (silicon carbide) substrate 21, a buffer which is nitride based and can include In (Indium) 23 on substrate, and another nitride based layer

27 which can include a quaternary layer. Edmond et al. fail to disclose the required substrate, the required quaternary layer and the required multilevel quaternary layer. However, Sugawara et al. disclose a semiconductor light emitting element where in Fig. 1 and in paragraphs 5-8, active layer 105 is disclosed to be quaternary AlInGa_N and is located over buffer layer 102. Furthermore, Sasanuma et al. disclose a semiconductor laser where in Fig. 6, the required InGa_N/InGaAl_N, multilayer quaternary structure is disclosed.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required substrate and the required quaternary layer and the required multilayer quaternary structure in Edmond et al. as taught by Sugawara et al. and Sasanuma et al. respectively, in order to have a semiconductor device with increased performance.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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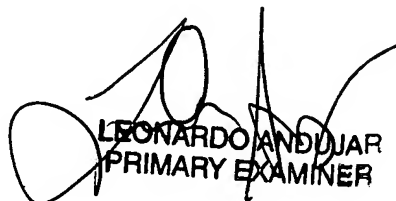
however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fazli Erdem whose telephone number is (571) 272-1914. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FE
October 9, 2006



LEONARDO ANDUJAR
PRIMARY EXAMINER